

What is claimed is :

1. A transformer comprising:

a metal core; and

a plurality of coil modules, each coil module having a predetermined
5 loop number of coils and an encapsulator comprising plastic material for
encapsulating the coils;

wherein a portion of the coils of the plurality of coil modules function as
primary coils while other portion of the coils of the plurality of coil modules
function as secondary coils, and the plurality of coil modules are stacked one on
10 another and each coil module surrounds the metal core.

2. The transformer of claim 1, wherein the coils of each coil module
are of a wound portion of at least one conductive wire.

15 3. The transformer of claim 1, wherein the coils of each coil module
are of a coil-shape portion of at least one conductive strip.

4. The transformer of claim 1, wherein the coils are arranged in a
substantially same plane.

20 5. The transformer of claim 1, wherein the coils are arranged as a
stack of coils.

6. The transformer of claim 1, wherein a group of coil modules are
25 connected in series or parallel.

7. The transformer of claim 1, wherein the insulating encapsulator is mixed with heat conductive material.

8. The transformer of claim 7, wherein the heat conductive material
5 comprising ceramic powder.

9. The transformer of claim 1, wherein there are a plurality of conductive wires in one coil module and the coils of these conductive wires are separated by the encapsulator.

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10. A transformer comprising:

a metal core; and

a plurality of coil modules, each coil module having a predetermined loop number of coils and an encapsulator comprising plastic material for

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encapsulating the coils;

wherein a portion of the coils of the plurality of coil modules function as primary coils while other portion of the coils of the plurality of coil modules function as secondary coils, and the plurality of coil modules are arranged in concentric circles surrounding the metal core.

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11. The transformer of claim 10, wherein the coils of each coil module are of a wound portion of at least one conductive wire.

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12. The transformer of claim 10, wherein the coils of each coil module are of a coil-shape portion of at least one conductive strip.

13. The transformer of claim 10, wherein the coils are arranged in a substantially same plane.

14. The transformer of claim 10, wherein the coils are arranged as a
5 stack of coils.

15. The transformer of claim 10, wherein a group of coil modules are connected in series or parallel.

10 16. The transformer of claim 10, wherein the insulating encapsulator is mixed with heat conductive material.

17. The transformer of claim 16, wherein the heat conductive material comprising ceramic powder.

15 18. The transformer of claim 10, wherein there are a plurality of conductive wires in one coil module and the coils of these conductive wires are separated by the encapsulator.

19. A coil module comprising:
20 a predetermined loop number of coils, the predetermined loop number being selected from a predetermined set; and
an insulating encapsulator comprising plastic material for encapsulating the coils and separating the coils from contact with other coils of another adjacent coil module when a plurality of the coil modules are installed in
25 a transformer wherein a portion of the plurality of coil modules function as primary coils while another portion of the plurality of coil modules function as secondary coils.

20.A method for manufacturing a transformer comprising:

providing a metal core;

selecting a plurality of coil modules made in advance, wherein each coil module has a loop number of coils and an insulating encapsulator

5 comprising plastic material for encapsulating the coils, and the selection of the coil modules is made according to the loop number of coils of the plurality of coils modules; and

stacking the plurality of coil modules one on another to surround the metal core wherein a portion of the coils of the plurality of coil modules function
10 as primary coils and other portion of the coils of the plurality of coil modules function as secondary coils.

21. The method of claim 20, further comprising a step of making groups of the coil modules, each group differentiated by the loop number of coils
15 embedded in one coil modules.

22. The method of claim 21, wherein in the step of making the groups of the coil modules, the coil in each coil module are arranged into a stack of coils.

20 23. The method of claim 21, wherein in the step of making the groups of the coil modules, the coils in each coil module are obtained by winding at least one conductive wire.

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24. The method of claim 21, wherein in the step of making the groups of the coil modules, the coils in each coil module are a portion of at least one conductive strip.

5 25. The method of claim 24, wherein the portion of the conductive strip is folded to form the coils in each coil module.

26. The method of claim 24, wherein in the step of making the groups of the coil modules, the conductive strip is made by stamping a conductive
10 material according to a coil pattern.

27. The method of claim 21, wherein in the step of making the groups of the coil modules, heat conductive material is mixed in the encapsulator.